REMARKS

Status of Claims:

Claim 1-19 are present for examination.

Obviousness Rejections:

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shiragaki (U.S. Patent Number 5,663,820) and further in view of Manchester et al. ("IP Over SONET") (hereinafter Manchester).

Claims 2-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Shiragaki and Manchester.

With respect to claims 1-19, the rejections are respectfully traversed.

Independent claim 1 recites in a switching system comprising:

> a switch;
>
> a plurality of input interfaces each connected to input ports of the switch, each of the input interfaces including a scrambler using a predetermined pseudorandom pattern generator, wherein each of the input interfaces inputs data to sequentially output frames including scrambled data to a corresponding input port of the switch; and
>
> a plurality of output interfaces each connected to output ports of the switch, each of the output interfaces including a descrambler using the predetermined pseudorandom pattern generator, wherein each of the output interfaces inputs frames including scrambled data from a corresponding output port of the switch to output frames of original data,
>
> a scramble control method comprising the steps of:
>
> "resetting the scramblers simultaneously; and
>
> resetting the descramblers simultaneously."

A scramble control method including the above-quoted features has the advantage that scramblers of a plurality of input interfaces are reset simultaneously and descramblers of a plurality of output interfaces are reset simultaneously, where the plurality of input interfaces

are connected to input ports of a switch and the plurality of output interfaces are connected to output ports of the switch. By resetting the scramblers simultaneously and resetting the descramblers simultaneously, it is possible to operate all the scramblers and descramblers synchronously so that, even if switching is performed per frame of the data, the synchronization between the scramblers and the descramblers can be maintained. (Substitute Specification; page 9, lines 13-17; page 20, lines 9-16; page 24, lines 1-5; page 25, lines 7-11).

Neither Shiragaki nor Manchester, alone or in combination, disclose or suggest a scramble control method including the above-quoted features. The Examiner states that, "Shiragaki disclosed an optical switch with multiple input and output interfaces (See Shiragaki Fig. 3 Elements 19, 31, and 32) but Shiragaki failed to disclose a scrambler and descrambler at each input and output interface." Then, the Examiner states that "Shiragaki did disclose that this switch is for a Synchronous Optical NETwork (SONET)." (Emphasis Added).

However, Shiragaki did not disclose that the switch is for a Synchronous Optical NETwork (SONET). Indeed, Shiragaki expressly states that,

> "[r]eferring now to FIG. 1, there is shown an optical communications network where a frame format **other than** the standard digital frame such as SDH (Synchronous Digital Hierarchy) and SONET (Synchronous Optical NETwork) is used for transmitting optical payload signal and OAM (operations, administration and maintenance) signal on separate resources such as optical signals of different wavelengths, optical signals of different polarization plane, and modulation of an optical carrier with baseband and subcarrier frequencies." (Shiragaki; column 3, lines 46-55) (Emphasis Added).

Thus, the optical communications network in Shiragaki does not have a switch for SONET, but is specifically designed for a frame format other than SONET. Shiragaki does not use the standard frame format known as SONET, because such a frame format combines payload and OAM bits in a single frame. (Shiragaki; column 1, lines 36-39). Shiragaki notes that with SONET, protection switching of optical channels would require time-division multiplexing of optical signals down to baseband level in order to extract necessary OAM

information. (Shiragaki; column 1, lines 39-47). Instead, Shiragaki uses a frame format that allows for transmitting optical payload signals and OAM signals on separate resources. (Shiragaki; column 3, lines 46-55). Thus, Shiragaki teaches away from the use of SONET.

In contrast, the scrambler of Manchester is specifically designed for data that is sent over a synchronous optical network (SONET). (Manchester; page 136, column 1; page 138 to page 139). Therefore, it would not have been obvious to the ordinary person skilled in the art at the time of the invention to employ the teachings of Manchester to the invention of Shiragaki, because the scrambler of Manchester works for SONET, but the switch in Shiragaki is designed to work with a frame format other than SONET.

Furthermore, in applicant's specification, applicant explains why the scrambler of Manchester cannot be applied directly to an optical switching system. (Substitute Specification; page 7, line 25 to page 9, line 7). Applicant describes the system of Manchester and then states: "However, this system cannot be applied directly to an optical switching system." (Substitute Specification; page 8, lines 14-15) (Emphasis Added). Applicant explains that the synchronizing system of Manchester is devised for a one-to-one transmission device. (Substitute Specification; page 9, lines 4-7). Furthermore, applicant explains that the scrambler in Manchester is a self-synchronizing scrambler in which the internal state of the scrambler varies with bit strings of the past. (Substitute Specification; page 8, lines 15-18) (see also Manchester; page 139).

The system of Manchester works in a one-to-one configuration between one scrambler and one descrambler because both the scrambler and the descrambler can maintain synchronization based on bit strings of the past. However, as applicant explains, in an optical switching system, a transmission source of a frame received by an output interface varies every time the optical switch performs switching. (Substitute Specification; page 8, lines 18-20). As a result, synchronization between a scrambler and a descrambler is lost when switching is performed, because a different scrambler may be transmitting data to the same descrambler after switching is performed, but the new different scrambler would not be synchronized with the descrambler because the new different scrambler would not know the bit strings of the past. (Substitute Specification; page 8, lines 21-22).

Indeed, applicant expressly states that, "[t]his is a problem peculiar to a switching system, and this problem cannot be solved by synchronizing systems devised for a one-to-one transmission device including the above-mentioned system devised by Manchester et al." (Substitute Specification; page 9, lines 4-7) (Emphasis Added). Moreover, the teachings of Shiragaki do not address the problem because, as recognized by the Examiner, "Shiragaki failed to disclose a scrambler and descrambler".

Therefore, independent claim 1 is neither disclosed nor suggested by the cited prior art and, hence, is believed to be allowable.

Independent claim 11 recites in a switching system comprising:

a switch;

a plurality of input interfaces each connected to input ports of the switch, each of the input interfaces including a scrambler using a predetermined pseudorandom pattern generator, wherein each of the input interfaces inputs data to sequentially output frames including scrambled data to a corresponding input port of the switch; and

a plurality of output interfaces each connected to output ports of the switch, each of the output interfaces including a descrambler using the predetermined pseudorandom pattern generator, wherein each of the output interfaces inputs frames including scrambled data from a corresponding output port of the switch to output frames of original data,

a scramble control method comprising the steps of:

"at each of the scramblers,

generating a scrambler state indicating a pseudorandom pattern generated by the predetermined pseudorandom pattern generator in frame timing;

assembling a frame including the scrambler state;

transferring the frame including the scrambler state to the switch;

at each of the descramblers,

receiving a frame including a scrambler state;

resetting the predetermined pseudorandom pattern generator to the pseudorandom pattern indicated by the scrambler state." (Emphasis Added).

The Examiner rejected claim 11 as being unpatentable over the combination of Shiragaki and Manchester. As discussed above with respect to claim 1, it would not have been obvious to combine Shiragaki and Manchester because the optical network of Shiragaki works with a frame format other than SONET while the scrambler of Manchester is a SONET scrambler. Thus, Shiragaki expressly teaches away from the combination. In addition, the remarks made with respect to claim 1 concerning applicant's explanation as to why the scrambler of Manchester cannot be applied directly to an optical switching system, also applies with respect to claim 11.

Therefore, independent claim 11 is neither disclosed nor suggested by the cited prior art and, hence, is believed to be allowable.

Independent claim 16 recites a switching system with similar features as features of the scramble control method of independent claim 1. Therefore, independent claim 16 is believed to be allowable for at least the same reasons that independent claim 1 is believed to be allowable.

Independent claim 18 recites a switching system with similar features as features of the scramble control method of independent claim 1. Therefore, independent claim 18 is believed to be allowable for at least the same reasons that independent claim 1 is believed to be allowable.

Independent claim 19 recites a switching system with similar features as features of the scramble control method of independent claim 11. Therefore, independent claim 19 is believed to be allowable for at least the same reasons that independent claim 11 is believed to be allowable.

The dependent claims are deemed allowable for at least the same reasons indicated above with regard to the independent claims from which they depend.

Conclusion:

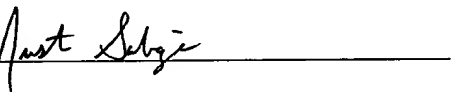
Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date April 28, 2005

By 

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